

Response to Review 1 of “Demonstrating the use of UNSEEN climate data for hydrological applications: case studies for extreme floods and droughts in England” by Kay et al.

The authors would like to thank the reviewer for their comments on our manuscript. We describe below the changes we will make in response to each comment.

The study provides an application of the UNSEEN climate data sets to eight regions in England assessing the potential effects for one recent flood and one recent drought event using a modeling chain including a simple monthly water balance model informed by long historical run of the G2G model and including fidelity tests.

In my opinion, this is a valuable contribution to the discussion on how to be able to estimate of plausible, but yet unseen future extreme events.

The structure of the manuscript is logical and easy to follow and it is very clearly written overall.

Thank you

I have only minor comments and would else recommend publication:

- while for droughts and drought recovery in most cases a monthly temporal scale is sufficient, for floods daily or often sub-daily is the scale of interest. The authors mention in their conclusion that that is the case, but I would recommend to pick that up earlier in the manuscript, best already in the methods, maybe discussed in limitations again

We will add mention of this earlier in the manuscript, and refer the reader to Section 4.2 on 'limitations of the models and data', where it is addressed.

- in the description of the summer drought 2022 and autumn flood 2023 (2.3.1 and 2.3.2) how much was each region affected by these? all similar? Some particular?

We will add some more information about regional similarities/differences.

- the figure colors can not be distinguished if printed in b&w, please consider adjusting the hue.

We will revisit the colour scheme used in the figures, but given the complexity it may not be possible for all elements to show clearly in black and white.

Line by line comments (mostly editorial):

page 3

- L11: remove brackets

- L12: place the unit directly after rates

- L13: remove brackets

OK, thank you.

page 5

-L6 remove brackets; are these variables just examples or is the list exhaustive?

This will be clarified.

page 7

-L20 remove brackets

OK, thank you.